

AGRICULTURAL EDUCATION AND COLONIAL DEVELOPMENT.

IN a paper on "The Teaching of Agriculture" read by Mr. F. B. Smith, director of agriculture in the Transvaal, before the British Association, there occurs a statement which is of special interest to educationists and to the public of this country. The paper was read with the object of directing attention to the keen desire for agricultural education that now exists in South Africa, and to the improvements in the condition of the colonies which might be looked for if a satisfactory system of education and research were established. But though colonial Governments are willing, and the enlightened members of the agricultural community are anxious to get on, progress is slow, and chiefly because suitable teachers for agricultural colleges and other officers for colonial departments of agriculture are hard to find. The words used by Mr. Smith are:—"The difficulty of obtaining men qualified to fill such positions is great, and frequently one of two things happens: either an *unsuitable man from the Homeland* (the italics are ours) is appointed, with the result that a department is seriously hampered or discredited, or a selection has to be made from abroad. I am not speaking without experience, for I could give many examples in support of my argument that a great deal of harm has been caused to agricultural administration and education in the colonies by the sending out of inexperienced and unsuitable men from Great Britain." Again, after stating that the demand will continue, and is likely to increase, Mr. Smith asks, "Cannot some steps be taken to improve matters, and to supply the want?"

Unfortunately it is not only in South Africa that the Mother Country's insufficiency is being felt, for within the past few years there has been quite an extraordinary awakening to the value of agricultural education in the British possessions, and the Homeland has not been able to afford the guidance and assistance which her colonies expect. That there is an awakening we have ample evidence; thus a recent number of the *West India Bulletin* informs us that the president of the West Indian Agricultural Conference of 1905 remarked:—"Agricultural education is at the root of the successful development of these colonies," and another speaker referred with surprise to the rapid rise in importance of this subject. Again, from the Indian Financial Statement for 1905 we learn that the Government of India, which in 1902-3 spent about 60,000*l.* on improving agriculture, has now sanctioned an expenditure of 250,000*l.* for the provision of agricultural institutions, experimental farms, &c. But although this forward policy has the approval of all sections of the Indian public, it must wait, for in India, as in South Africa, the problem is to find men competent to give effect to the policy.

The director of agriculture for the Transvaal is perhaps too severe on the "unsuitable man from the Homeland." The good work accomplished by this same "unsuitable man" in the past ten years has been one of the chief causes of the rise in popularity of agricultural education. But it must be admitted not only that men are hard to find, but that when found they seldom have the training which is desirable. The fact is that Britain still looks upon agricultural education purely from the national standpoint, and gives no thought to her colonies. Through the Board of Agriculture, agricultural institutions in England and Wales receive about 10,000*l.* per annum; but these grants are made to provide for the education of the English farmer, and without reference to our foreign possessions.

A few weeks ago a deputation waited upon the Board of Agriculture to ask that increased grants might be given for teaching and research in connection with English agriculture, and it was admitted by the Board that further aid in this direction was desirable. If the present grants are insufficient for the special needs of this country, it is clear that they are quite inadequate for the requirements of Greater Britain. It may be argued that India and the colonies should provide for themselves; but we hope that Mr. Smith's question may not receive this answer. Greater Britain makes the reasonable request, "If you send us men, send us trained men," and if we neglect this request our colonies must find men elsewhere. They cannot mark time indefinitely, nor can they risk their prosperity by engaging the services of incompetent men.

England is herself content with her small outlay on agricultural education and research, but we must not conclude that what is good enough for the Mother Country is good enough for her colonies. English agriculture is highly developed, is conservative in its methods, and there is no agricultural party to be reckoned with by the English statesman. We do not ask for, and we do not get, the assistance claimed by the farmers of countries like Denmark and the United States. In India and the colonies it is different; agriculture is undeveloped, applied science may do much for the farmer, and the prosperity and contentment of the agriculturist are of great political importance. Though, therefore, the English agriculturist does not complain of the meagre endowments of agricultural science, we must not assume that those responsible for the development of Greater Britain will remain satisfied with what this country is now doing. The colonies have hitherto taken our men, because men trained in British schools and universities have been their traditional leaders; but it is clear that if we wish them to continue to do so we must make greater efforts to meet the new demand.

Nothing could possibly be more damaging to the reputation, not only of English teachers of agriculture, but of England, than such an experience as the director of agriculture for the Transvaal recorded before the British Association. If our men are incompetent, if they are unfit to lead, the sooner, not only our teachers, but our statesmen, take the matter up the better. The colonies must know, and without delay, that the universities and colleges of this country can supply trained agriculturists. We are indebted to the director of agriculture for his plain if unpalatable warning. There appears to be a danger that while the means of securing a preference for our merchandise are being discussed, we may lose the preference now accorded to our men.

MAGNETIC WORK IN INDIA.¹

THIS relates to the temperature coefficients of horizontal force magnetographs of the Watson pattern belonging to the Indian Survey. The magnet system consists of magnetised iron wires, fixed parallel to one another, in a framework which is attached to a quartz fibre. The upper end of the fibre is attached to a torsion head, by turning which the magnet system is brought nearly perpendicular to the magnetic meridian. With increase of *H* (horizontal force) the magnet turns until the increased torsion balances the increased magnetic couple, and the position of the magnet is recorded

¹ Survey of India. Professional Papers, 1905. Serial No. 8. Experiments made to determine the Temperature Coefficients of Watson's Magnetographs. By Captain H. A. Denholm Fraser, R.E. Pp. 45; with 6 plates and 5 sheets of curves. (Calcutta: Office of the Superintendent of Government Printing, India, 1905.)

photographically by means of a beam of light reflected from a mirror attached to the magnet. With rise of temperature the magnetic moment diminishes slightly, whilst the rigidity of the quartz increases, both causes tending to diminish the angle of torsion and so simulating a fall in H . Measurements made on one of the magnetographs prior to its despatch from England showed a temperature coefficient of approximately 6γ for 1°C . ($1\gamma \equiv 1 \times 10^{-5} \text{ C.G.S.}$); but the values obtained in India with different magnet systems and suspensions are mostly about 12.5γ for 1°C . There is, however (see footnote p. 13), no necessary contradiction between these results. The untwisting caused by a given rise of temperature varies as the total angle of torsion, and this varies as the local value of H . But H in India is nearly twice as large as in England. Thus the movement of the magnet due to the change of rigidity in the fibre caused by a rise of 1° is nearly twice as big in India as in England. The memoir discusses the temperature experiments made in India, and the difficulties arising from imperfect temperature control, defects in quartz fibres or in the method of fixing them, and from other causes. The observational data are recorded, and exhibited in the curves, with a detail which is unusual in a printed volume. The values found for the temperature coefficients in India are five times larger than those applicable in England to some magnetographs of older types with metal suspensions. Even in magnetic chambers under refined temperature control, a small temperature coefficient has advantages which can be fully appreciated only by those experienced in the reduction of magnetic data. Thus the results of the present memoir, though of limited general interest, deserve the attention of instrument makers.

NOTES.

WE regret to see the announcement that Prof. C. J. Joly, F.R.S., Royal Astronomer of Ireland, died on January 4 after a long illness. He was only forty-one years of age.

A BILL which provides for the adoption of the weights and measures of the metric system in all departments of the Government of the United States on July 1, 1908, has been introduced into Congress.

A CENTRAL NEWS message from New York states that by the will of the late Mr. Yerkes the Yerkes Observatory, Chicago, is given the sum of 20,000.

ARRANGEMENTS are being made for the celebration of the twenty-first anniversary of the foundation of the Royal Geographical Society of Australia, Queensland. It is proposed at the end of the current session, in the last week of June, to carry out some appropriate form of commemorative ceremonial to mark the close of the first twenty-one years of activity of the society.

ON Tuesday next, January 16, Prof. E. H. Parker will deliver the first of a course of three lectures at the Royal Institution on impressions of travel in China and the Far East. The Friday evening discourse on January 19 will be delivered by Prof. J. J. Thomson, the subject being some applications of the theory of electric discharge to spectroscopy. On February 2 the discourse will be delivered by Prof. S. P. Thompson on the electric production of nitrates from the atmosphere.

As the signature "H. Weir" occurs so frequently to the illustrations of "Wood's Natural History," which was the popular zoological work of a generation ago, a refer-

ence to the death of Mr. Harrison Weir, the well known animal artist, claims a place in our columns. Mr. Weir, who was born at Lewes in 1824, died at his residence at Appledore, Kent, on January 3, at the close of a long period of retirement. Although his portraits of wild animals can scarcely be compared with those of Wolf, they are in most cases—except when drawn from menagerie specimens in poor condition—true to nature and display considerable spirit. Mr. Weir's special *forte* was, however, the portraiture of domesticated poultry, and his work "Our Poultry" has a permanent value as an authentic record of the characteristics of the different breeds at the time it was written. As a judge of poultry and pigeons the deceased artist had a high reputation.

THE first expedition sent out to West Africa by the Liverpool Institute of Commercial Research in the Tropics left England on January 6. The members, who are conducted by Lord Mountmorres, director of the institute, are:—Mr. Kenneth Fisher, chemist; Mr. L. Farmer, botanist; Dr. Slater Jackson, entomologist; and Mr. Coates, commercial adviser. The expedition is proceeding to Dakar, Bathurst, Konakri, and, if possible, to the Cameroons. Being only an experimental expedition, the stay on the west coast will not be of very long duration; in fact, Lord Mountmorres is to return in time to visit the exhibition of rubber at Ceylon in April. But should the results prove satisfactory there is every probability that the institute will dispatch a second expedition to spend a long period in Africa. One of the chief objects of the expedition will be an inquiry into the cultivation of rubber—how to improve the quality of West African rubber in order to bring it up to the same standard as the similar rubber from other colonies, and how to protect and increase the present supply. An effort will also be made to discover new sources of oils, and to find means of increasing the supply by making use of present waste. As regards the study of the prospects of West Africa becoming a fibre-producing country, this branch of the work will include investigation regarding the establishment of hemp, cotton, jute, and ramie growing, and also of new fibres.

WE have received a copy of the report of the Albany Museum for 1904, in which substantial progress is recorded on all sides. It is satisfactory to learn that the proposed cooperation between the museum and the Rhodes University College promises to be of advantage to both institutions. Dr. Schönland, the director of the museum, has already been appointed professor of botany in the college.

MUCH interest attaches to a paper by Mr. Pilgrim in part iii. of the *Records of the Geological Survey of India* for 1905, in which the author describes an elephant skull from the alluvium of the Godaveri valley. This skull belongs to *Elephas namadicus*, of Falconer and Cautley, but the author brings forward evidence which in his opinion proves the identity of that form with the European *E. antiquus*.

OUR knowledge of the land and fresh-water molluscs of Formosa and Japan has been greatly extended by the work of Japanese collectors, the results of which are described by Messrs. Pilsbry and Hirase in the October, 1905, issue of the *Proceedings of the Philadelphia Academy of Sciences*. The collections from Formosa were made in Taiwan, and chiefly consist of land-shells; but although no labour or expense were spared, the number of specimens procured was not so large as anticipated. Nevertheless, out of a total of seventy-one species, twenty-